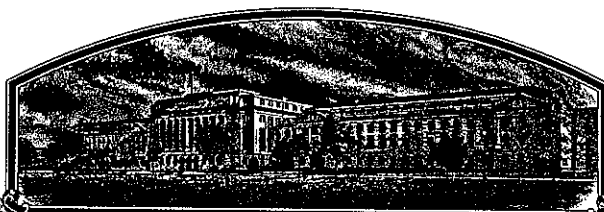


No.

8700104



# THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

**Pioneer Hi-Bred International, Inc.**

Whereas, THERE HAS BEEN PRESENTED TO THE

**Secretary of Agriculture**

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF *eighteen* YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT (CAP. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

SOYBEAN

'9391'



In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D. C. this 30th day of June in the year of our Lord one thousand nine hundred and eighty-eight.

Attest:

*Kenneth H. Evans*  
Commissioner  
Plant Variety Protection Office  
Agricultural Marketing Service

*Richard E. Lyng*  
Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE  
AGRICULTURAL MARKETING SERVICE

FORM APPROVED: OMB NO. 0581-0055


## APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions on reverse)

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S) Pioneer Hi-Bred International, Inc.		2. TEMPORARY DESIGNATION	3. VARIETY NAME 9391
4. ADDRESS (Street and No. or R.F.D. No., City, State, and Zip Code) 700 Capital Square 400 Locust Street Des Moines, IA 50309		5. PHONE (Include area code) 319/234-0335	FOR OFFICIAL USE ONLY PVPO NUMBER 8700104
6. GENUS AND SPECIES NAME Glycine Max	7. FAMILY NAME (Botanical) Leguminosae		FILING DATE March 31, 1987 TIME 9:30 <input checked="" type="checkbox"/> A.M. <input type="checkbox"/> P.M.
8. KIND NAME Soybean	9. DATE OF DETERMINATION September, 1982 January, 1985 (increase)		FEES RECEIVED AMOUNT FOR FILING \$1800.00 DATE March 31, 1987 AMOUNT FOR CERTIFICATE \$200.00 DATE May 2, 1988
10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION (Corporation, partnership, association, etc.) Corporation			12. DATE OF INCORPORATION 1926
11. IF INCORPORATED, GIVE STATE OF INCORPORATION Iowa			
13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS Clark W. Jennings 3261 West Airline Hwy Waterloo, IA 50703-9610 Mary Helen Mitchell (Copy) 700 Capital Square - 400 Locust Street Des Moines, IA 50309 PHONE (Include area code):			

14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED	
a. <input checked="" type="checkbox"/> Exhibit A, Origin and Breeding History of the Variety (See Section 52 of the Plant Variety Protection Act.)	
b. <input checked="" type="checkbox"/> Exhibit B, Novelty Statement.	
c. <input checked="" type="checkbox"/> Exhibit C, Objective Description of Variety (Request form from Plant Variety Protection Office.)	
d. <input type="checkbox"/> Exhibit D, Additional Description of Variety.	
e. <input checked="" type="checkbox"/> Exhibit E, Statement of the Basis of Applicant's Ownership.	
15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? (See Section 83(a) of the Plant Variety Protection Act.) <input type="checkbox"/> Yes (If "Yes," answer items 16 and 17 below) <input checked="" type="checkbox"/> No	
16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED? <input type="checkbox"/> Foundation <input type="checkbox"/> Registered <input type="checkbox"/> Certified
18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S.? <input type="checkbox"/> Yes (If "Yes," give date) <input checked="" type="checkbox"/> No	
19. HAS THE VARIETY BEEN RELEASED, OFFERED FOR SALE, OR MARKETING IN THE U.S. OR OTHER COUNTRIES? <input type="checkbox"/> Yes (If "Yes," give names of countries and dates) <input checked="" type="checkbox"/> No	
20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable. The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act. Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.	

SIGNATURE OF APPLICANT 	DATE March 19, 1987
SIGNATURE OF APPLICANT	DATE 1

**Attachment: 9391 Soybean (March, 1987)**

**Exhibit A:** Variety **9391** evolved from a cross of (Williams 79 X A3127) X A3127. It is an F5-derived variety which was advanced to the F5 generation by modified single-seed descent. The F6 progeny row of **9391** was grown in Ohio during the summer of 1982. Subsequently, **9391** has undergone four years of extensive testing and purification and has been observed by the breeder to be uniform and stable for all plant traits from generation to generation, with no evidence of variants.

Four acres of **9391** (breeders seed) were grown in 1985. 100 acres of parent seedstock (foundation seed equivalent) were grown in 1986.

**Exhibit B:** Variety **9391** is most similar to Williams 79. However, **9391** has purple flowers, whereas Williams 79 has white flowers.

**Exhibit E:** Pioneer Hi-Bred International, Inc. is the sole, original, and first breeder of soybean variety **9391**, for which it solicits a certificate of protection.

Amendment: 9391 Soybeans (April, 1988)

Exhibit B:

Variety 9391 is most similar to Williams 79. However, 9391 has purple flowers, whereas Williams 79 has white flowers.

Variety 9391 also resembles variety 9331, CX 326 and CX 366 in that all varieties have purple flowers, brown (tawny) pubescence and black hila. However, 9391 is significantly later maturing than 9331 by 7 days (see Table 1), significantly later maturing than CX 326 by 4 days (see Table 2), and significantly taller than CX 366 by 4.4 cms (see Table 3).

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Table 1. Paired Comparison (Days to Maturity) 1987

OBSERVATION #	9331( $X_2$ )	9391( $X_1$ )		( $X_1 - X_2$ )	( $X_1 - X_2$ ) <sup>2</sup>
1	128	135		7	49
2	126	134		8	64
3	127	135		8	64
4	128	134		6	36
5	127	134		7	49
6	126	134		8	64
7	127	133		6	36
8	126	133		7	49
9	127	134		7	49
10	127	136		9	81
11	127	135		8	64
12	128	135		7	49
TOTAL	1,524	1,612		88	654
$\bar{X}$	127	134.33		7.33	

N = 12

$$s_d = \sqrt{\frac{654 - [(88)^2/12]}{12(11)}} = 0.256$$

$$t = \frac{7.33}{0.256} = 28.63 \text{ ** for 11 df}$$

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Table 2. Paired Comparison (Days to Maturity) 1987 Data

OBSERVATION #	CX 326( $X_2$ )	9391( $X_1$ )		( $X_1 - X_2$ )	( $X_1 - X_2$ ) <sup>2</sup>
1	130	135		5	25
2	130	134		4	16
3	130	135		5	25
4	131	134		3	9
5	131	134		3	9
6	130	134		4	16
7	129	133		4	16
8	131	133		2	4
9	130	134		4	16
10	130	136		6	36
11	132	135		3	9
12	129	135		6	36
TOTAL	1,563	1,612		49	217
$\bar{X}$	130.25	134.33		4.08	

N = 12

$$s_d = \sqrt{\frac{217 - [(49)^2/12]}{12(11)}} = 0.358$$

$$t = \frac{4.08}{0.358} = 11.40 \text{ ** for 11 df}$$

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3 R/S  
 Table 4. Paired Comparison (Plant Height in cm) 1987 Data

OBSERVATION #	CX 366( $X_2$ )	9391( $X_1$ )		( $X_1 - X_2$ )	( $X_1 - X_2$ ) <sup>2</sup>
1	99	104		5	25
2	107	109		2	4
3	109	112		3	9
4	107	112		5	25
5	107	112		5	25
6	107	112		5	25
7	104	107		3	9
8	107	112		5	25
9	107	114		7	49
<b>TOTAL</b>	<b>954</b>	<b>994</b>		<b>40</b>	<b>196</b>
$\bar{X}$	<b>106.0</b>	<b>110.4</b>		<b>4.4</b>	

N = 9

$$s_d = \sqrt{\frac{196 - [(40)^2/9]}{9(8)}} = 0.503$$

$$t = \frac{4.4}{0.503} = 8.75 \text{ ** for 8 df}$$

U.S. DEPARTMENT OF AGRICULTURE  
AGRICULTURAL MARKETING SERVICE  
LIVESTOCK, MEAT, GRAIN & SEED DIVISION  
PLANT VARIETY PROTECTION OFFICE  
BELTSVILLE, MARYLAND 20705

EXHIBIT C  
(Soybean)

OBJECTIVE DESCRIPTION OF VARIETY  
SOYBEAN (*Glycine max* L.)

NAME OF APPLICANT(S) Pioneer Hi-Bred International, Inc.	TEMPORARY DESIGNATION	VARIETY NAME 9391
ADDRESS (Street and No., or R.F.D. No., City, State, and Zip Code) 700 Capital Square 400 Locust Street Des Moines, IA 50309		FOR OFFICIAL USE ONLY PVPO NUMBER 8700104

Choose the appropriate response which characterizes the variety in the features described below. When the number of significant digits in your answer is fewer than the number of boxes provided, place a zero in the first box when number is 9 or less (e.g.,  ).

## 1. SEED SHAPE:



1 = Spherical (L/W, L/T, and T/W ratios = &lt; 1.2)

3 = Elongate (L/T ratio &gt; 1.2; T/W = &lt; 1.2)

2 = Spherical Flattened (L/W ratio &gt; 1.2; L/T ratio = &lt; 1.2)

4 = Elongate Flattened (L/T ratio &gt; 1.2; T/W &gt; 1.2)

## 2. SEED COAT COLOR: (Mature Seed)

1 = Yellow

2 = Green

3 = Brown

4 = Black

5 = Other (Specify) \_\_\_\_\_

## 3. SEED COAT LUSTER: (Mature Hand Shelled Seed)

1 = Dull ('Corsoy 79'; 'Braxton')

2 = Shiny ('Nebsoy'; 'Gasoy 17')

## 4. SEED SIZE: (Mature Seed)

Grams per 100 seeds

## 5. HILUM COLOR: (Mature Seed)

1 = Buff

2 = Yellow

3 = Brown

4 = Gray

5 = Imperfect Black

6 = Black

7 = Other (Specify) \_\_\_\_\_

## 6. COTYLEDON COLOR: (Mature Seed)

1 = Yellow

2 = Green

## 7. SEED PROTEIN PEROXIDASE ACTIVITY:

1 = Low

2 = High

## 8. SEED PROTEIN ELECTROPHORETIC BAND:

1 = Type A (SP1<sup>a</sup>)2 = Type B (SP1<sup>b</sup>)

## 9. HYPOCOTYL COLOR:

1 = Green only ('Evans'; 'Davis')

2 = Green with bronze band below cotyledons ('Woodworth'; 'Tracy')

3 = Light Purple below cotyledons ('Beeson'; 'Pickett 71')

4 = Dark Purple extending to unifoliate leaves ('Hodgson'; 'Coker Hampton 266A')

## 10. LEAFLET SHAPE:

1 = Lanceolate

2 = Oval

3 = Ovate

4 = Other (Specify) \_\_\_\_\_



## 11. LEAFLET SIZE:

☐ 21 = Small ('Amsoy 71'; 'A5312')  
3 = Large ('Crawford'; 'Tracy')

2 = Medium ('Corsoy 79'; 'Gasoy 17')

## 12. LEAF COLOR:

☐ 21 = Light Green ('Weber'; 'York')  
3 = Dark Green ('Gnome'; 'Tracy')

2 = Medium Green ('Corsoy 79'; 'Braxton')

## 13. FLOWER COLOR:

☐ 2

1 = White

2 = Purple

3 = White with purple throat

## 14. POD COLOR:

☐ 1

1 = Tan

2 = Brown

3 = Black

## 15. PLANT PUBESCENCE COLOR:

☐ 2

1 = Gray

2 = Brown (Tawny)

## 16. PLANT TYPES:

☐ 21 = Slender ('Essex'; 'Amsoy 71')  
3 = Bushy ('Gnome'; 'Govan')

2 = Intermediate ('Amcor'; 'Braxton')

## 17. PLANT HABIT:

☐ 3

1 = Determinate ('Gnome'; 'Braxton')

2 = Semi-Determinate ('Will')

3 = Indeterminate ('Nebsoy'; 'Improved Pelican')

## 18. MATURITY GROUP:

☐ 061 = 000  
9 = VI2 = 00  
10 = VII3 = 0  
11 = VIII4 = I  
12 = IX5 = II  
13 = X

6 = III

7 = IV

8 = V

## 19. DISEASE REACTION: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant)

## BACTERIAL DISEASES:

☐ 0Bacterial Pustule (*Xanthomonas phaseoli* var. *sojensis*)☐ 0Bacterial Blight (*Pseudomonas glycinea*)☐ 0Wildfire (*Pseudomonas tabaci*)

## FUNGAL DISEASES:

☐ 0Brown Spot (*Septoria glycines*)Frogeye Leaf Spot (*Cercospora sojina*)☐ 0

Race 1

☐ 0

Race 2

☐ 0

Race 3

☐ 0

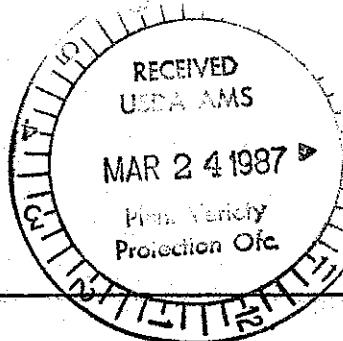
Race 4

☐ 0

Race 5

☐ 0

Other (Specify)

☐ 0Target Spot (*Corynespora cassiicola*)☐ 0Downy Mildew (*Peronospora trifoliorum* var. *manshurica*)☐ 0Powdery Mildew (*Microsphaera diffusa*)☐ 0Brown Stem Rot (*Cephalosporium gregatum*)☐ 0Stem Canker (*Diaporthe phaseolorum* var. *caulivora*)

## 19. DISEASE REACTION: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant) (Continued)

## FUNGAL DISEASES: (Continued)

☐ 0 Pod and Stem Blight (*Diaporthe phaseolorum* var. *sojae*)☐ 0 Purple Seed Stain (*Cercospora kikuchii*)☐ 0 Rhizoctonia Root Rot (*Rhizoctonia solani*)Phytophthora Rot (*Phytophthora megasperma* var. *sojae*)☐ 2 Race 1 ☐ 2 Race 2 ☐ 2 Race 3 ☐ 1 Race 4 ☐ 1 Race 5 ☐ 2 Race 6 ☐ 2 Race 7☐ 2 Race 8 ☐ 2 Race 9 ☐ 2 Other (Specify) Races 13, 15, 17, 21, 23, 24 (resistant)

## VIRAL DISEASES:

☐ 0 Bud Blight (Tobacco Ringspot Virus)☐ 0 Yellow Mosaic (Bean Yellow Mosaic Virus)☐ 0 Cowpea Mosaic (Cowpea Chlorotic Virus)☐ 0 Pod Mottle (Bean Pod Mottle Virus)☐ 0 Seed Mottle (Soybean Mosaic Virus)

## NEMATODE DISEASES:

Soybean Cyst Nematode (*Heterodera glycines*)☐ 0 Race 1 ☐ 0 Race 2 ☐ 0 Race 3 ☐ 0 Race 4 ☐ Other (Specify) \_\_\_\_\_☐ 0 Lance Nematode (*Hoplaimus Colombus*)☐ 0 Southern Root Knot Nematode (*Meloidogyne incognita*)☐ 0 Northern Root Knot Nematode (*Meloidogyne Hapla*)☐ 0 Peanut Root Knot Nematode (*Meloidogyne arenaria*)☐ 0 Reniform Nematode (*Rotylenchulus reniformis*)☐ OTHER DISEASE NOT ON FORM (Specify): \_\_\_\_\_

## 20. PHYSIOLOGICAL RESPONSES: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant)

☐ 1 Iron Chlorosis on Calcareous Soil☐ Other (Specify) \_\_\_\_\_

## 21. INSECT REACTION: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant)

☐ 0 Mexican Bean Beetle (*Epilachna varivestis*)☐ 0 Potato Leaf Hopper (*Empoasca fabae*)☐ Other (Specify) \_\_\_\_\_

## 22. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED.

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant Shape	Williams 79	Seed Coat Luster	Williams 79
Leaf Shape	Williams 79	Seed Size	Williams 79
Leaf Color	Williams 79	Seed Shape	Williams 79
Leaf Size	Williams 79	Seedling Pigmentation	Williams 79

## 23. GIVE DATA FOR SUBMITTED AND SIMILAR STANDARD VARIETY: Paired Comparison Data

VARIETY	NO. OF DAYS MATURITY	PLANT LODGING SCORE	CM PLANT HEIGHT	LEAFLET SIZE		SEED CONTENT		SEED SIZE G/100 SEEDS	NO. SEEDS/POD
				CM Width	CM Length	% Protein	% Oil		
9391 Submitted	141	1.8	102	-	-	-	-	15.5	-
Williams 79 Name of Similar Variety	139	1.1	107	-	-	-	-	13.0	-

## PUBLICATIONS USEFUL AS REFERENCE AIDS FOR COMPLETING THIS FORM:

1. Caldwell, B.E., ed. 1973. Soybeans: Improvement, Production, and Uses. Amer. Soc. Agron. Monograph No. 16.
2. Buttery, B.R. and R.I. Buzzell. 1968. Peroxidase activity in seeds of soybean varieties. Crop Sci., 8: 722-725.
3. Hymowitz, T. 1973. Electrophoretic analysis of SBTI-A<sub>2</sub> in the USDA soybean germplasm collection. Crop Sci., 13: 420-421.
4. Payne, R.C. and L.F. Morris. 1976. Differentiation of soybean cultivars by seedling pigmentation patterns. J. Seed Technol. 1: 1-19.

